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10/731,476	12/10/2003	Ichiro Kataoka	03500.017766.	5423

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EXAMINER	
BARTON, JEFFREY THOMAS	
ART UNIT	PAPER NUMBER
1795	
MAIL DATE	DELIVERY MODE
05/07/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/731,476	KATAOKA ET AL.	
	Examiner	Art Unit	
	Jeffrey T. Barton	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *20081219*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filed on 28 January 2009 does not place the application in condition for allowance.

Status of Rejections Pending Since the Office Action of 28 October 2008

2. All previous rejections are withdrawn due to Applicant's amendment.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plessing et al (US 6,369,316) in view of Chikaki et al. (6,149,757)

Plessing discloses a photovoltaic module and method of producing the same. The module is shown in figure 1 with the method in figure 2.

Regarding claim 1, Plessing shows the method of producing in figure 2. The method comprises the steps of mounting the body to be laminated, 1, on a tabular member, 15; carrying the body to be laminated along with the tabular member onto the mounting board, 21 (belt 16 does the carrying); heat-bonding the body to be laminated by pressing using the pressing means, 17 including 18, 19 and 20; carrying out the body to be laminated along with the tabular member from the mounting board after parting the pressing means from the body to be laminated (16 carries out); and separating the body to be laminated from the tabular member (separation section 27, see column 6, lines 45-50).

Regarding claims 2 and 3, Plessing discloses the use of release sheets, or separating films between the module and the tabular member (column 6, lines 15-18). It is the position of the examiner that the separating films and tabular member do not

have perfectly flat surfaces down to the atomic level and thus the surfaces have some measure of irregularity or an irregular form on the surfaces as required in the claims. As applicant has not defined the specificities of these irregular forms, the reference is deemed to be anticipatory for the claims.

Plessing does not explicitly disclose cooling means that cool the pressing means, nor does Plessing explicitly disclose the pressing means being provided opposite to the mounting board as claimed. Regarding claim 4, Plessing does not specifically require a specific mounting board temperature.

Chikaki teaches a laminating apparatus as shown in figure 1. The apparatus includes a heating stage, 10, that can include a water cooled pipe, a cooling means (column 4, lines 44-48). Furthermore, Chikaki teaches a pressing means (Membrane 4) provided opposite the heated stage 10.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the configuration of the heating stage, including the water cooled pipe, of Chikaki within the method of Plessing because the heater of Chikaki accurately controls the heating temperature by the inclusion of the water cooled pipe (Chikaki column 4, lines 44-48). In the method of Plessing, as in Chikaki, a membrane is a pressing means. (Column 6, lines 34-36) The use of a water cooled pipe within the heating plate, 21, of Plessing cools the pressing means by cooling means as required by the claim, in that during lamination, the membrane is in thermal communication with the stage via the laminated body.

Regarding the limitations "wherein the pressing means is cooled by cooling means after carrying out the body" and "wherein another body to be laminated is carried in along with a tabular member made of a metal plate onto the mounting board after cooling the pressing means", these limitations are deemed to be obvious within the method taught by the combined art because:

(a) it would have been obvious to carry out the lamination procedure of Plessing repeatedly to form numerous laminated modules. This is suggested by Plessing in that the carrier plates are sent back to the loading station after the completion of the lamination of a module stack. (Column 6, lines 46-48) The only reason for doing this is to repeat the procedure in order to produce multiple laminated module stacks. Clearly, Plessing intends that numerous modules will be made in the lamination system disclosed (Plural modules disclosed also at Column 7, lines 24-26); and

(b) it would have been obvious to use the cooling means taught by Chikaki et al to cool the pressing means at any point that the temperature of the pressing means exceeded the desired temperature. This is obviously the nature of the temperature control taught by Chikaki et al. (Column 4, lines 44-48)

From this, it follows that the cooling step that is obvious from the teachings of Chikaki et al could obviously be performed in the middle of a series of repeated laminations (i.e. after one, several, or several hundred laminated module stacks have been carried out of the laminator 17 of Plessing), including at points when the membrane is in thermal communication with the stage, because the cooling means will

obviously be employed at any point that the temperature of the pressing means is too high. Such a point would be after carrying out one or numerous laminated bodies.

In an alternate interpretation, it is noted that Applicant's specification teaches an "air blow" as exemplary cooling means. (Page 13, lines 14-17) It is also the Examiner's position that the ventilation flow of air that returns the vacuum lamination apparatus to ambient pressure after lamination in the method of Plessing et al and Chikaki et al will obviously be at or near room temperature, and will therefore have a cooling effect on the membrane that had been in contact with the heated laminated body until the ventilation took place, and will therefore read on the instant cooling means. Again, since it would have been obvious to perform numerous sequential laminations in the combined methods as described above, such cooling will obviously take place after one or several bodies have been carried out and further bodies to be laminated will be carried in subsequently, as required in the claim.

Regarding claim 4, the choice of specific lamination temperature is dependent on the specific application i.e. the specific lamination system, the item to laminated, and optimization of the lamination process. It would be obvious to one skilled in the art to make such a determination of operating temperature based on the specific application/optimization. Absent any unexpected results, the choice of the specific temperature as within the claim would be obvious for the method taught by the prior art.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Plessing et al and Chikaki et al as applied to claims 1-4 above, and further in view of Yamada et al (U.S. 6,127,622).

Plessing et al and Chikaki et al are relied upon for the reasons given above in addressing claims 1-4.

Neither Plessing et al nor Chikaki et al require a specific organic peroxide crosslinking agent.

Yamada teaches a laminated solar cell module as shown in figure 5. Yamada teaches the use of an encapsulating foam made of EVA for example (column 7, paragraph 4) and a crosslinking agent for the encapsulating foam made of an organic peroxide that has a 1-hour half-life temperature of between 100 and 170 ºC (column 8, last paragraph).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the crosslinking agent of Yamada within the method of Plessing et al and Chikaki et al, because the crosslinking agent improves the heat resistance and bond strength of the photovoltaic module (Yamada column 8, paragraph 7). It would have been further obvious to one of ordinary skill in the art at the time the invention was made to choose the specific half-life temperature of the claim because Yamada teaches that the crosslinking agent can have a 1-hour half-life temperature range that includes the claimed range. Absent any unexpected results, the selection of this portion of the range would be obvious for the combination. Because Yamada, Plessing et al, and Chikaki et al are concerned with solar cell modules, one would have

a reasonable expectation of success from the combination. Thus the combination meets the claim.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Plessing et al and Chikaki et al as applied to claims 1-4 above, and further in view of Taylor. (US 4,426,633)

Plessing et al and Chikaki et al are relied upon for the reasons given above in addressing claims 1-4.

Neither Plessing et al nor Chikaki et al explicitly teaches a material used for the separating films used to prevent adhesion of the laminated module to the carrier plate.

Taylor is relied upon for teaching known release films used in lamination methods to prevent adhesion of the laminated product to the lamination apparatus. Taylor teaches the use of glass-fiber reinforced PTFE as a release sheet in a lamination process. (Column 6, lines 8-45)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Plessing et al and Chikaki et al by specifically selecting glass fiber/PTFE release sheets as the separating films (Plessing, Column 6, lines 15-17), as taught by Taylor, because Taylor teaches that glass fiber/PTFE sheets are effective in preventing adhesion of the laminated products to the apparatus. (Column 6, lines 8-45) Because Taylor, Chikaki et al, and Plessing et al are all concerned with laminating systems and methods, a skilled artisan would have had a reasonable expectation of success from this combination. Furthermore, Plessing's

silence concerning the material used to make the separating films would have led a skilled artisan to turn to related prior art release films, such as those of Taylor, to select an appropriate material. Note also that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

9. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plessing et al (US 6,369,316) in view of Ogawa. (US 6,041,840)

Plessing discloses a photovoltaic module and method of producing the same. The module is shown in figure 1 with the method in figure 2.

Regarding claim 1, Plessing shows the method of producing in figure 2. The method comprises the steps of mounting the body to be laminated, 1, on a tabular member, 15; carrying the body to be laminated along with the tabular member onto the mounting board, 21 (belt 16 does the carrying); heat-bonding the body to be laminated by pressing using the pressing means, 17 including 18, 19 and 20; carrying out the body to be laminated along with the tabular member from the mounting board after parting the pressing means from the body to be laminated (16 carries out); and separating the body to be laminated from the tabular member (separation section 27, see column 6, lines 45-50).

Regarding claims 2 and 3, Plessing discloses the use of release sheets, or separating films between the module and the tabular member (column 6, lines 15-18). It is the position of the examiner that the separating films and tabular member do not

have perfectly flat surfaces down to the atomic level and thus the surfaces have some measure of irregularity or an irregular form on the surfaces as required in the claims. As applicant has not defined the specificities of these irregular forms, the reference is deemed to be anticipatory for the claims.

Plessing does not explicitly disclose cooling means that cool the pressing means, nor does Plessing explicitly disclose the pressing means being provided opposite to the mounting board as claimed. Regarding claim 4, Plessing does not specifically require a specific mounting board temperature.

Ogawa is cited for teaching a known vacuum lamination device and method. The apparatus includes a heating board, 23, on which the bodies to be laminated are placed, and a pressing means (Film body 3) provided opposite the heating board. In the method, as shown in Figure 11, when the laminated body is taken out, film body 3 is drawn against upper platen 1, through which cooling fluid is continuously passed in path 7. (Column 12, lines 2-27) This positioning of film 3 upon removal of the laminated product meets the limitation to cooling after the body is carried out.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the device configuration and lamination method of Ogawa within the method of Plessing because Ogawa teaches that laminated products made by his method are stabilized in quality and can be made in a shortened forming cycle. (Column 12, lines 12-14)

Furthermore, it would have been obvious to carry out the lamination procedure of the combination repeatedly to form numerous laminated modules. This is suggested by

Plessing in that the carrier plates are sent back to the loading station after the completion of the lamination of a module stack. (Column 6, lines 46-48) The only reason for doing this is to repeat the procedure in order to produce multiple laminated module stacks. Clearly, Plessing intends that numerous modules will be made in the lamination system disclosed (Plural modules disclosed also at Column 7, lines 24-26) Such repeated lamination would clearly entail carrying in another body as claimed.

Regarding claim 4, the choice of specific lamination temperature is dependent on the specific application i.e. the specific lamination system, the item to laminated, and optimization of the lamination process. It would be obvious to one skilled in the art to make such a determination of operating temperature based on the specific application/optimization. Absent any unexpected results, the choice of the specific temperature as within the claim would be obvious for the method taught by the prior art.

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Plessing et al and Ogawa as applied to claims 1-4 above, and further in view of Yamada et al (U.S. 6,127,622).

Plessing et al and Ogawa are relied upon for the reasons given above in addressing claims 1-4.

Neither Plessing et al nor Ogawa requires a specific organic peroxide crosslinking agent.

Yamada teaches a laminated solar cell module as shown in figure 5. Yamada teaches the use of an encapsulating foam made of EVA for example (column 7,

paragraph 4) and a crosslinking agent for the encapsulating foam made of an organic peroxide that has a 1-hour half-life temperature of between 100 and 170 ºC (column 8, last paragraph).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the crosslinking agent of Yamada within the method of Plessing et al and Ogawa, because the crosslinking agent improves the heat resistance and bond strength of the photovoltaic module (Yamada column 8, paragraph 7). It would have been further obvious to one of ordinary skill in the art at the time the invention was made to choose the specific half-life temperature of the claim because Yamada teaches that the crosslinking agent can have a 1-hour half-life temperature range that includes the claimed range. Absent any unexpected results, the selection of this portion of the range would be obvious for the combination. Because Yamada, Plessing et al, and Ogawa are concerned with solar cell modules, one would have a reasonable expectation of success from the combination. Thus the combination meets the claim.

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Plessing et al and Ogawa as applied to claims 1-4 above, and further in view of Taylor. (US 4,426,633)

Plessing et al and Ogawa are relied upon for the reasons given above in addressing claims 1-4.

Neither Plessing et al nor Ogawa explicitly teaches a material used for the separating films used to prevent adhesion of the laminated module to the carrier plate.

Taylor is relied upon for teaching known release films used in lamination methods to prevent adhesion of the laminated product to the lamination apparatus. Taylor teaches the use of glass-fiber reinforced PTFE as a release sheet in a lamination process. (Column 6, lines 8-45)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Plessing et al and Ogawa by specifically selecting glass fiber/PTFE release sheets as the separating films (Plessing, Column 6, lines 15-17), as taught by Taylor, because Taylor teaches that glass fiber/PTFE sheets are effective in preventing adhesion of the laminated products to the apparatus. (Column 6, lines 8-45) Because Taylor, Ogawa, and Plessing et al are all concerned with laminating systems and methods, a skilled artisan would have had a reasonable expectation of success from this combination. Furthermore, Plessing's silence concerning the material used to make the separating films would have led a skilled artisan to turn to related prior art release films, such as those of Taylor, to select an appropriate material. Note also that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Response to Arguments

12. Applicant's arguments filed 28 January 2009 have been fully considered but they are not persuasive.

Applicant argues that the prior art does not teach the instant step of cooling the pressing means, which are provided opposite to the mounting board. The Examiner respectfully disagrees. Applicant is correct that the cooling water of Chikaki is provided to the heating stage of the lamination device, but as set forth above, it is the Examiner's position, that the cooling water will provide cooling to the membrane of the laminator when the membrane is in thermal contact with the heating stage. Since it would have been obvious to perform numerous sequential laminations within the method, and the cooling could obviously be performed at any stage of a given lamination process, the limitations of the claims are met, as described in detail above.

Applicant disagrees that Chikaki's cooling could be performed in the middle of a series of repeated laminations. No detailed arguments against the position described in detail above are provided, and accordingly the position is maintained.

Note also the alternative interpretation of Plessing et al in view of Chikaki et al, which is also considered to meet the new claim limitations, and the alternative grounds relying upon Ogawa introduced in response to the new limitations.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Jeffrey T. Barton whose telephone number is (571)272-1307. The examiner can normally be reached on M-F 9:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeffrey T. Barton/
Examiner
6 May 2009